

77. METAL BORING AND DRILLING.
Boring and drilling appliances.

Fig. 1

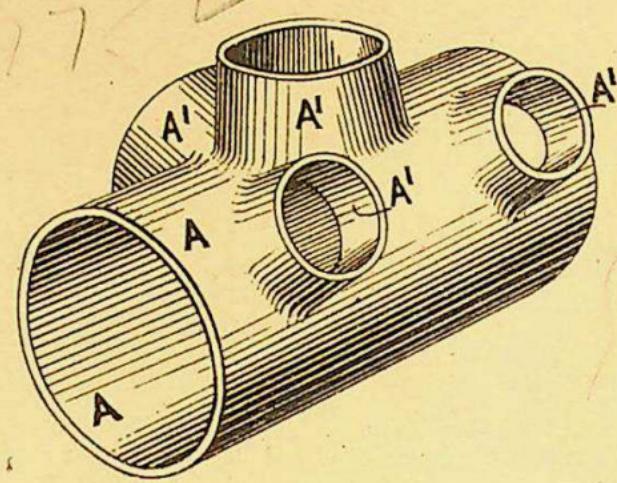


FIG. 2.

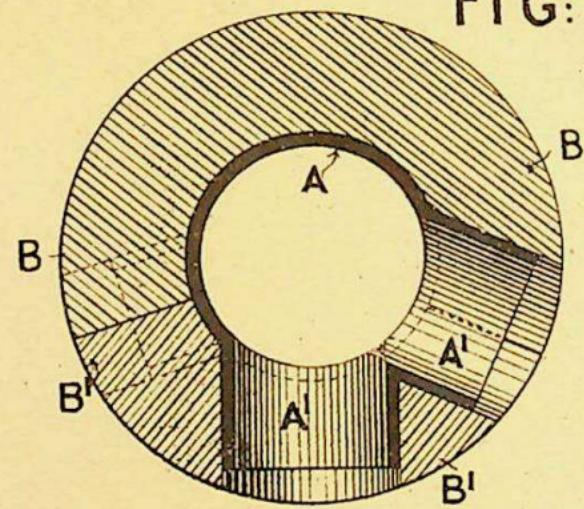
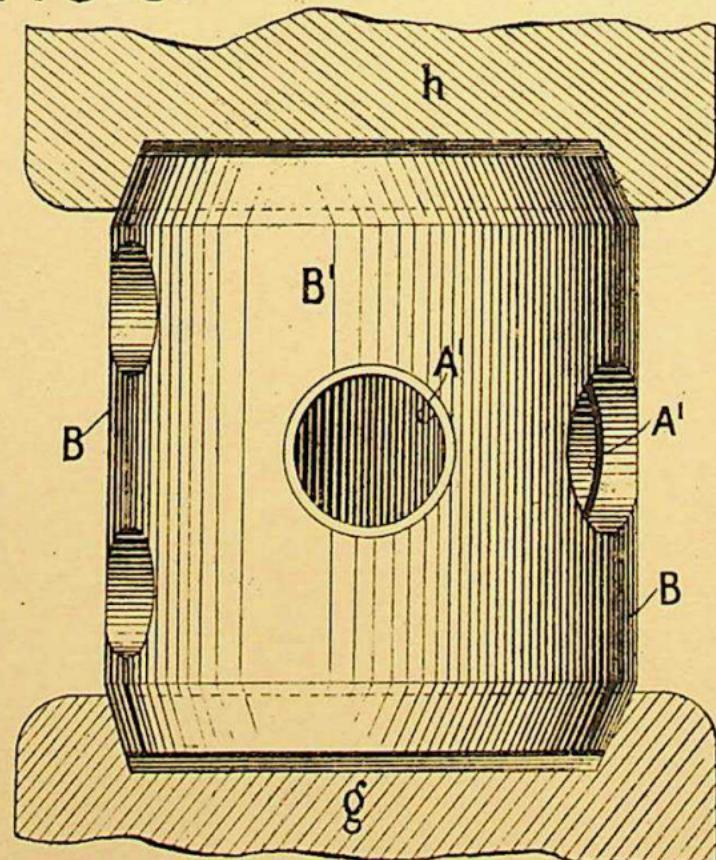


FIG. 3.



[This Drawing is a reproduction of the Original on a reduced scale.]

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See U.S. Pat. No. 933749 - 9/14/1909 - 7763
Am. Mach. June 12-1911 No. 1896

279-6

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Fig. 4

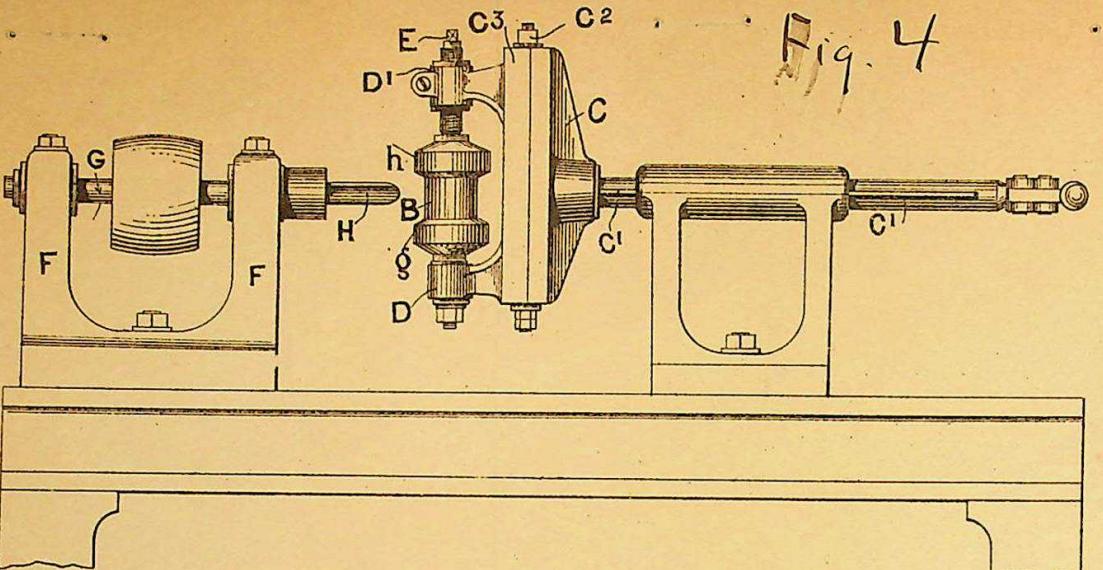


FIG: 6.

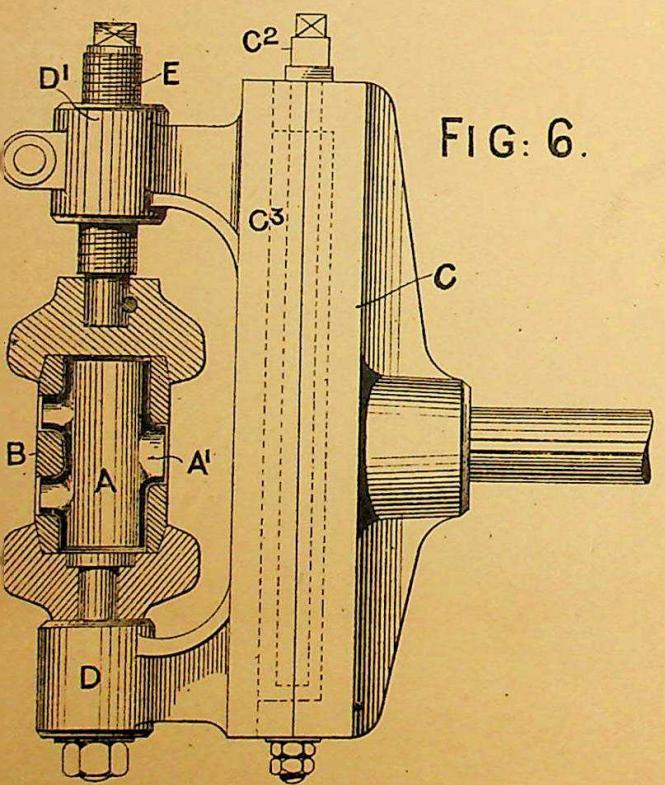


FIG: 7.

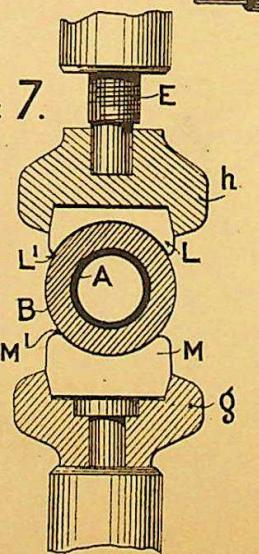


FIG: 5.

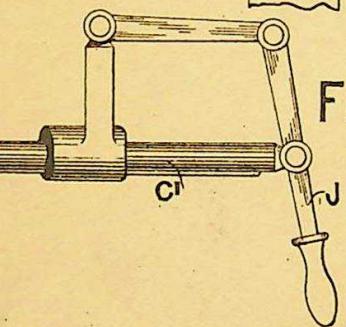
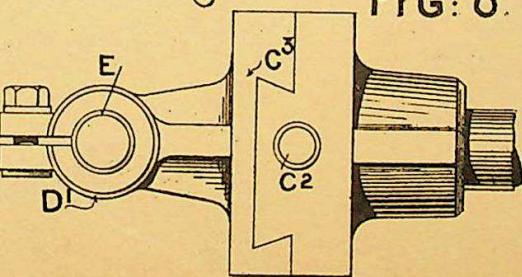
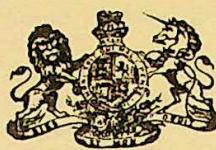


FIG: 8.



N° 28,694



A.D. 1896

Date of Application, 15th Dec., 1896

Complete Specification Left, 3rd June, 1897—Accepted, 14th Aug., 1897

PROVISIONAL SPECIFICATION.

New or Improved Machinery or Apparatus for Perfecting, Finishing, Truing Up, or Reaming Tubes, Tubular Unions, Sockets, or the like.

I, RUDOLF CHILLINGWORTH, of Ostbahnhof, Nuremberg, in the Empire of Germany, Metal Stamper, do hereby declare the nature of this invention to be as follows:—

This invention refers to new or improved machinery or apparatus for finishing, perfecting, or truing up tubes, tubular unions, sockets or the like, hereinafter called calibrating, that is to say, for truing up or perfecting the form of same after manufacture, the apparatus or machine hereafter described being particularly applicable to the treatment of such parts when manufactured by the process described in the specification of British Patent, dated 23rd day of April 1895, 5 No. 8050.

The machine or apparatus is of considerable importance for calibrating tubular parts used in the construction of velocipedes, such for example as the tubular bottom brackets described in the aforesaid specification of Patent, which brackets are formed with tubular sockets to connect the frame tubes, while the main cylindrical part is to carry the crank axle bearings. In these tubular brackets it is very important that the sockets or unions should be placed accurately relatively to each other and to the axis of the main tube, and that the main tube should be truly cylindrical internally. By the apparatus or machinery as hereafter described this operation of calibrating can be effected in a simple, accurate, and rapid manner 10 by mechanical means.

According to my invention, and when for example operating upon such a bracket as before mentioned, the piece of tube with sockets which is to be calibrated, is inserted whilst in a heated state into a divided hollow case or mould, which is correctly formed internally and is constructed so that the two or more parts of the 15 case when placed together, closely encircle or surround the tube and its sockets. The bringing together of the component parts of the case, causes the contained bracket to assume a correct and perfect external form and any deviation of the sockets from their proper position is therefore corrected at once, and it is then only necessary to make both the tube, and the sockets, exactly cylindrical 20 internally.

These operations are also effected whilst the tube is situated in the aforesaid hollow case, by means of apparatus which may be conveniently mounted on a frame similar to that of a lathe or the like, and comprises a chuck or holder which is mounted on the front end of the movable centre spindle, and carries in connection with an adjusting screwed spindle a sliding carriage which can be moved transversely to the axis of the spindle. This carriage is provided with clamps, 25 that serve to hold the case. The lower one of these clamps is fixed, whilst the upper clamp is carried by an adjusting spindle, and can be moved up and down

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thereby. The clamps are formed with recesses in which are fitted the conical ends of the case, and the bringing together of the clamps forces the parts of the case together.

When the case with its contained bracket tube, is in position, the sliding carriage is moved by means of the spindle until the socket to be calibrated has assumed a 5 position coincident with the axis of the spindle. The spindle of the fixed head stock carries a rimer or boring tool, the diameter of which is equal to the internal diameter of the socket.

The tube having been clamped in the apparatus in the manner described, the spindle together with the chuck or holder, is moved by means of a handle or lever 10 in the direction towards the fixed head stock, whereby the rimer is caused to enter a socket, and to rimer it out to an exact measurement, and thus finish it internally.

After moving back the spindle, if there are more sockets situated in one and the same plane to be treated, the carriage is moved to a certain extent so as to bring the next socket into the central axis of the rimer, whereupon by moving the 15 spindle the said socket is also trued up in the manner above described. After all the sockets of the same diameter that are situated in one plane have been trued up or calibrated, the spindle is screwed upwards, and the case is removed from the clamping apparatus, and the next piece of tube is placed in it.

Now for the purpose of straightening the tube itself, which usually loses its 20 exact cylindrical shape in consequence of the drawing process, the case must be clamped, with its central axis made to coincide with the axis of the spindle. For this purpose packing pieces are employed which are placed with their conical rear ends into the clamps and serve by means of their hollow cylindrical surfaces, to hold firmly and partly enclose the case when the clamp is pressed down.

The "calibrating" operation is effected in the same manner as above described by moving the case in the direction of its longitudinal axis towards the rimer. 25

Dated this 15th day of December 1896.

BREWER & SON,
London & Leeds, Agents for the Applicant. 30

COMPLETE SPECIFICATION.

New or Improved Machinery or Apparatus for Perfecting, Finishing, Truing Up, or Reaming Tubes, Tubular Unions, Sockets, or the like.

I, RUDOLF CHILLINGWORTH of Ostbahnhof, Nuremberg, in the Empire of 35 Germany, Metal Stamper, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention refers to new or improved machinery or apparatus for finishing, perfecting, or truing up tubes, tubular unions, sockets or the like, hereinafter 40 called calibrating, that is to say, for truing up or perfecting the form of same after manufacture.

This machinery or apparatus is of considerable importance for calibrating tubular parts used in the construction of velocipedes, such for example, as the tubular bottom brackets, which brackets are formed with projecting tubular 45 sockets to connect the frame tubes, while the main cylindrical part is to carry the crank axle bearings. In these tubular brackets it is very important that the said sockets or unions should be placed accurately as required, relatively to each other and to the axis of the main tube, and that the main tube should be truly

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cylindrical internally. By the apparatus or machinery as hereafter described this operation of "calibrating" can be effected in a simple, accurate and rapid manner by mechanical means.

Fig. 1 is a perspective view shewing a tubular bracket with sockets, being an example of one of many constructions suitable for being operated upon according to this invention, Fig. 2 is a horizontal section of such a bracket in a case or mould, hereafter described, and Fig. 3 is a sectional elevation shewing the case or mould, and closing and holding means for same. Fig. 4 is a side elevation of so much of "calibrating" machinery or apparatus aforesaid as will be necessary for the purpose of this specification. Fig. 5 is a plan view shewing a lever mechanism for operating a part of the machine shewn at Fig. 4. Fig. 6 is a sectional side elevation drawn to a larger scale than the previous figures, shewing the mechanism for holding and adjusting the parts to be operated upon. Fig. 7 is a sectional end view shewing further gripping or holding mechanism, and Fig. 8 is a plan view of the parts shewn at Fig. 6.

According to this invention, and when for example operating upon such a bracket as before mentioned, say such as shewn at Fig. 1, the piece of tube A having sockets A¹ is heated to a sufficient degree, and is then enclosed within a divided case or mould. This case or mould is divided in such a manner as to enable it to be placed together and to enclose the tubular bracket A, and its sockets A¹, thus when the sockets are situated as at Fig. 1 the case may be divided as shewn at Fig. 2 into two parts as B B¹, or it may be divided into three or more parts all according to the relative positions, forms or numbers of the sockets, apertures being formed to permit access to the interior of the hollow article. The interior form of the case B B¹ is exactly that which the exterior surfaces of brackets and sockets should assume or possess when finished. Externally the case B B¹ Fig. 3 is generally cylindrical or may be that of a right polygonal prism the ends being tapered in a proper degree so that it may be inserted (when the bracket A has been enclosed) between two clamping heads h and g parts of which are shewn in section at Fig. 3, and these heads are then brought together so that the parts of the case B are closed, and the contained heated bracket and sockets are caused to assume a correct and perfect external form; any deviation of the sockets A¹ from their proper position is therefore corrected at once, and it is then only necessary to make both the tube, and the sockets, exactly cylindrical internally.

These operations are effected whilst the tube is situated in the aforesaid hollow case, by means of apparatus shewn at Figs. 4 to 8. This apparatus may be conveniently mounted on a frame similar to that of a lathe or the like and comprises a chuck or holder C which is fixed on the front end of a longitudinal movable shaft C¹. The chuck or holder C carries in connection with an adjusting screwed spindle C² a sliding carriage C³ which can be moved transversely to the axis of the shaft C¹. The carriage C³ is provided at each end with a bearing collar D D¹ best seen at Fig. 6, from which are carried the clamps g and h that serve to hold the case B. The lower one g of these clamps is fixed to its collar or carrying arm D whilst the upper clamp h is carried by an adjustable spindle E, screw threaded into and through the collar D¹, and the clamp h can therefore be moved up and down by means of said spindle E which is for this purpose provided with say a square upper end onto which may be fitted a lever handle; thus the bracket having been inserted within the parts of the case B, the latter is then placed between the clamps g and h, and the latter are closed together by operating the screw E, and the bracket and its sockets thereby brought to perfect external form, while the case remains held firmly between the clamps g and h.

When the case with its contained bracket tube is thus in position, the sliding carriage C³ is moved by means of the spindle C² until the socket such as A¹ to be calibrated has assumed a position coincident with the axis of the shaft C¹. F is a fixed head stock carrying in bearings a driven shaft G, which carries a rimer or boring tool H, the diameter of which is equal to the internal diameter of the socket which is required to be trued.

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The tube having been thus clamped and set in position in the apparatus in the manner described, the shaft C¹ together with the chuck or holder C, is moved by means of a handle J Fig. 5 in the direction towards the fixed head stock F, whereby the rimer H is caused to enter a socket such as A¹ Fig. 6 to rimer it out to an exact measurement, and thus finish it truly internally. 5

After moving back the shaft C¹, (if there are more sockets A¹ situated in one and the same vertical plane, to be treated), the carriage C³ is moved to a certain extent so as to bring the next socket into the central axis of the rimer, whereupon by moving the shaft C¹ the said socket is also trued up in the manner above described. After all the sockets of the same diameter that are situated in one plane have been 10 trued up or calibrated, the screwed spindle E is screwed upwards, and the case is removed from the clamping apparatus, and the next piece of tube is placed in it.

Now for the purpose of straightening the tube A itself, which tube usually loses its exact cylindrical shape in consequence of the drawing process, the case B must be clamped in the manner shewn in Fig. 7 that is to say, its central axis 15 must be made to coincide with the axis of the shaft C¹. For this purpose packing pieces L and M are employed which are placed with their conical ends into the clamps and serve by means of their hollow cylindrical surfaces L¹ M¹, to hold firmly and partly enclose, the case B when the clamp h is pressed down.

The "calibrating" operation is effected in the same manner as above described 20 for the sockets, by moving the case in the direction of its longitudinal axis towards the rimer.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:— 25

1. In finishing, perfecting, or truing up tubes, tubular unions, sockets and the like, a case adapted to receive the article to be treated in a heated state, such case being composed of divided parts having when brought together, an internal space to correspond with the external configuration the article should assume, clamps adapted to be brought towards each other to close together the parts of 30 the case and thereby force the article into true external form, a sliding shaft to carry the clamping device and case, means for adjusting the latter relatively to the axes of the rotating rimer, and means for sliding the shaft and causing the rimer to enter apertures in the case and true up the interior of the tubular article, substantially as set forth.

2. The new or improved machine or apparatus for perfecting, truing up, or finishing, tubes, tubular unions or tube sockets, characterised by a rotating rimer or the like, in combination with a clamping device arranged opposite said rimer, and serving to clamp the tubes or tubular parts which are situated in a hollow case, said case being adapted to be moved by means of a sliding carriage C³ perpendicular to the axis of the shaft G, carrying the tool or rimer, and also to be moved in the direction of the said axis towards the rimer, in such a manner that the said rimer is caused to enter the tubular socket situated in front of it, all arranged and acting substantially as and for the purposes hereinbefore described. 35

3. The general arrangement and combination of parts composing the machine 45 or apparatus for truing up, finishing, or perfecting tubes, tubular unions, or the like, all constructed and acting, substantially as and for the purposes described and illustrated with reference to the accompanying drawings.

Dated this 3rd day of June 1897.

RUDOLF CHILLINGWORTH. 50

Witness:

E. G. BREWER,
33, Chancery Lane, London.